

2010-2025 Scenario Analysis for Hydrogen Fuel Cell Vehicles and Infrastructure Meeting

Review and Discussion of Preliminary Results

August 9-10, 2006, Washington, DC

**Discussion Group 1:
Summary Presentation**

Market Penetration Rates

- *General Comment* – Value proposition to the customer and supply chain must be superior to alternatives in the 2010-2025 timeframe
- *General Comment* – Government role in educating the public and providing financial incentives is needed and must be sustained to make the value proposition attractive to customers and the supply chain
 - Early fleet customers are not enough, need mass personal vehicle markets; incentives are mandatory
- *General Comment* – For vehicles sales to begin in 2012, the technology has to be ready to go by 2007 or 2008
- *Suggested Improvement* – Add transit bus scenarios and consider how hydrogen buses will complement the deployment of personal and fleet vehicles and infrastructure
- *Suggested Improvement* – There is a “top-down” and “bottom-down” view and both are critical
 - The credibility of the market penetration rates would be enhanced by providing more transparent information on the assumptions used and the context on which the scenarios are based

Lighthouse Networks & Station Layout

- *General Comment* – The lighthouse concept is a good approach, it resembles the growth of the gasoline infrastructure, but regional and intercity access is also important
- *Missing Element* – Is there a way to standardize designs on a national basis to streamline the daunting task of local engagement, buy-in, siting, and permitting?
- *Suggested Improvement* – Need to include the time and cost associated with complicated state and local permitting processes in the build-out time and cost for lighthouse scenarios
- *Suggested Improvement* – Need to assess the relative risks of build-out strategies in terms of the capital requirements for infrastructure development
 - Relative risk – station size vs. utilization
- *Suggested Improvement* – Thousands of vehicles will require public 70 MPa convenient fueling infrastructure; there is no consensus on this point

Hydrogen Production & Delivery Options

- *General Comment* – For the early economics to work, it will be necessary to leverage hydrogen production volumes to meet needs other than vehicle fueling, such as industrial and electrical power
- *Missing Element* – What is the business model for ownership, operation, and profitability of hydrogen fueling stations?
 - Do not assume existing gas stations are the most likely or desirable sites
- *Suggested Improvement* – Need to add life cycle carbon emissions as metric for evaluating hydrogen production and delivery options
- *Suggested Improvement* – There needs to be additional “out-of-the-box” thinking about hydrogen production and delivery
 - For example: near-term renewable supply options, home refueling, neighborhood refueling, co-production, and co-generation
- *Suggested Improvement* – Transition scenario should include case studies of local economies
 - Include analysis of impacts on labor force, maintenance and repair, and electric and natural gas grids

Options for Policies & Incentives

- *General Comment* – Tie incentives to problems, not solutions; let the marketplace find the best solutions
- *General Comment* – Mandates without the corresponding enabling incentives that change consumer purchasing behavior are crippling to industry (OEMs and vulnerable supply base)
- *Suggested Improvement* – Consider policies to address liability and risks
 - Government risk pools
 - Protection for small station owner/operators
 - OEMs and supply base
- *Suggested Improvement* – Carbon tax that is revenue neutral and split between industry and the customer

Demonstration Program Scenarios

- *General Comment* – Demonstration stations should be as publicly accessible with as much open access as possible
 - All major OEMs and their customers
 - Open to non-members; accessible and useable by all OEM technology options
- *General Comment* – DOE's R&D activity will need to continue during the demonstration phase
- *General Comment* – There is concern that there is not much time to achieve consensus between OEMs and other stakeholders
- *General Comment* – Keep technology validation demonstrations small and concentrated; transport system (market readiness aspect) validation should be large and spatially distributed within a metropolitan region
- *Suggested Improvement* – Involve other Federal agencies, if possible (i.e., DOD)